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EXAMINER	
CORSARO, NICK	

ART UNIT	PAPER NUMBER
2684	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/805,233	FENG ET AL.	
	Examiner	Art Unit	
	Nick Corsaro	2684	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *15 July 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-45* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-45* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

RESPONSE TO AMENDMENT

Response to Arguments

1. Applicant's arguments filed 07/15/2004 have been fully considered but they are not persuasive.

The Applicant's argued features in the claims, i.e., providing signals from spaced apart acoustic sensors, each of the signals corresponding to two or more acoustic sources including desired a plurality of sources including interfering sources and a desired source, localizing the interfering sources from the first and second signals to provide a corresponding number of interfering source signals each corresponding to a different one of the interfering sources and each including a plurality of frequency components, the components each corresponding to a different frequency; and suppressing one or more different frequency components of each of the interfering source signals to reduce noise, read upon Kellermann in view of Elko as follows.

Kellermann is discussing a speech processing system in a mobile phone that includes several microphones to receive the speech signal from the user and other sources, such as back ground noise. To do this, Kellermann uses several microphones, therefore, Kellermann is disclosing the limitation of : "providing signals from spaced apart acoustic sensors, each of the signals corresponding to two or more acoustic sources including desired a plurality of sources including interfering sources and a desired source". Kellermann further discusses receiving all the signals from all the sources and isolating sources from particular areas during the pauses in the speech or when interfering noises are at higher levels. To accomplish this Kellermann performs a fast Fourier transform of the signals from the several microphones, isolates the noise signals from the different microphones signals and suppresses them. Therefore,, Kellermann is

disclosing the limitation of " area orienting the interfering sources from the first and second signals to provide a corresponding number of interfering source signals each corresponding to a different one of the interfering sources and each including a plurality of frequency components, the components each corresponding to a different frequency; and suppressing one or more different frequency components of each of the interfering source signals to reduce noise" .

Kellermann discussed eliminating noise sources from different microphones where the noise came from different positions in the users background, i.e., room or environment, by the positions of the microphones. Therefore, Kellermann is implying that the sources should be localized. The implication leads one to search for a similar reference that eliminates noise based on a localization to further enhance Kellermann's invention. As a result, Elko was used to show that one skilled in the art would modify Kellermann and localize. Elko showed localizing the signals from a user environment by using a microphone array, and isolating frequency components.

In conclusion Kellermann and Elko are performing similar functions with almost exactly the same components except Elko performs one more step of localizing. Therefore based on Elko statement in the background, i.e., that speech-processing systems have problems in noisy backgrounds, one is led to read Elko's reference to look for features that will enhance Kellermann.

As a result, Kellermann and Elko are disclosing the argued features, and based on the reasoning stated above there is motivation to combine in the reference and to one skilled in the art, ant since the two references are using almost identical components, the is expectation of success.

Therefore, the Applicant's arguments are not persuasive.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-11, 13-17, 26-28, 31-34, and 41, are rejected under 35 U.S.C. 103(a) as being unpatentable over Kellermann et al. (5,602,962) in view of Elko et al. (4,802,227).

Consider claim 1, Kellermann discloses providing a first signal from a first acoustic sensor and a second signal from a second acoustic sensor spaced apart from the first acoustic sensor (abstract lines 1-4, col. 5 lines 52-55, and col. 3 lines 1-17). Kellermann discloses the first signal and the second signal each corresponding to two or more acoustic sources, said acoustic sources including a plurality of interfering sources and a desired source (see col. 3 lines 1-17). Kellermann discloses area orienting the interfering, sources from the first and second signals to provide a corresponding number of interfering source signals each corresponding to a different one of the interfering sources and each including a plurality of frequency components the components each corresponding to a different frequency (see col. 3 lines 45-54, col. 3 lines 39-45, col. 1 lines 20-37, col. 4 lines 60-67, col. 5 lines 1-30, and col. 4 lines 10-35, where Kellermann discusses the noise associated with each microphone and location are processed). Kellermann discloses suppressing one or more different frequency components of each of the

interfering source signals to reduce noise (see col. 3 lines 45-67, col. 4 lines 55-67, and col. 5 lines 1-30).

Kellermann disclose area orienting the interfering sources (col. 3 lines 42-44, col. 1 lines 28-33, and col. 3 lines 35-67), said area orienting logically being localizing, however, Kellermann does not specifically disclose localizing. Elko teaches localizing (see col. 4 lines 18-41, col. 3 lines 40-65, col. 5 lines 60-67, col. 6 lines 1-7, and col. 5 lines 1-67).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of Kellermann, and localize, as taught by Elko, thus allowing improved directional sound capability where noise and sources change over relatively short time periods, as discussed by Elko (col. 2 lines 2-10, and col. 1 lines 10-67).

Consider claim 9, Kellermann discloses a system (see col. 3 lines 1-5). Kellermann discloses a pair of spaced apart acoustic sensors each arranged to detect two or more differently located acoustic sources and correspondingly generate a pair of input signals, said acoustic sources including a desired source and a plurality of interfering sources (see col. 1 lines 15-37, and col. 3 lines 1-17). Kellermann discloses a delay operator responsive to said input signals to generate a number of delayed signals therefrom (see col. 3 lines 17-25). Kellermann discloses a an area orienting operator responsive to said delayed signals to area oriented said interfering sources relative to location of said sensors and provide a plurality of interfering source signals each representative of a corresponding one of said interfering sources (see col. 3 lines 45-54, col. 3 lines 39-45, col. 1 lines 20-37, col. 4 lines 60-67, col. 5 lines 1-30, and col. 4 lines 10-35 where Kellermann discusses the noise associated with each microphone and location are processed). Kellermann discloses interfering source signals each being represented in terms of a plurality of

frequency components, said components each corresponding to a different frequency (see col. 3 lines 45-54, col. 3 lines 39-45, col. 1 lines 20-37, col. 4 lines 60-67, and col. 5 lines 1-30). Kellermann discloses an extraction operator responsive to said interfering source signals to suppress at least one of said frequency components of each of said interfering source signals and extract a desired signal corresponding to said desired source, said at least one of said frequency components being different for each of said interfering source signals (see col. 3 lines 35-67, col. 1 lines 15-37, col. 4 lines 63-67, col. 5 lines 1-24, and col. 4 lines 10-35). Kellermann discloses an output device responsive to said desired signal to provide an output corresponding to said desired source (see col. 5 lines 3-50).

Kellermann disclose area orienting operator responsive to the signals (col. 3 lines 42-44, col. 1 lines 28-33, and col. 3 lines 35-67), said area orienting operator logically being localizing, however, Kellermann does not specifically disclose a localizing operator. Elko teaches a localizing operator (see col. 4 lines 18-41, col. 3 lines 40-65, col. 5 lines 60-67, col. 6 lines 1-7, and col. 5 lines 1-67).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of Kellermann, and have localizing operator, as taught by Elko, thus allowing improved directional sound capability where noise and sources change over relatively short time periods, as discussed by Elko (col. 2 lines 2-10, and col. 1 lines 10-67)

Consider claim 17, Kellermann discloses a method (see col. 3 lines 1-5). Kellermann discloses positioning a first acoustic sensor and a second acoustic sensor to detect a plurality of differently located acoustic sources (see col. 1 lines 15-37, and col. 3 lines 1-17). Kellermann discloses generating a first signal corresponding to said sources with said first sensor and a

second signal corresponding to said sources with said second sensor (see col. 1 lines 15-37, and col. 3 lines 1-17). Kellermann discloses providing a number of delayed signal pairs from the first and second signals, the delayed signal pairs each corresponding to one of a number of positions relative to the first and second sensors (see col. 3 lines 17-35). Kellermann discloses area orienting the sources as a function of the delayed signal pairs and a number of coincidence patterns, the patterns each corresponding to one of the positions (see col. 3 lines 25-61). Kellermann discloses establishing, an expected variation of acoustic source position information with frequency attributable to a source at the one of the positions (see col. 3 lines 25-67, col. 4 lines 55-67, col. 5 lines , and col. 4 lines 10-35).

Kellermann disclose area orienting as a function of the signals (col. 3 lines 42-44, col. 1 lines 28-33, and col. 3 lines 35-67), said area orienting logically being localizing, however, Kellermann does not specifically disclose a localizing. Elko teaches a localizing (see col. 4 lines 18-41, col. 3 lines 40-65, col. 5 lines 60-67, col. 6 lines 1-7, and col. 5 lines 1-67).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of Kellermann, and have localizing, as taught by Elko, thus allowing improved directional sound capability where noise and sources change over relatively short time periods, as discussed by Elko (col. 2 lines 2-10, and col. 1 lines 10-67).

Consider claim 26, Kellermann discloses a system (see col. 3 lines 1-5). Kellermann discloses a pair of spaced apart acoustic sensors each configured to generate a corresponding one of a pair of inputs signals, the signals being representative of a number of differently located acoustic sources (see col. 1 lines 15-37, and col. 3 lines 1-17). Kellermann discloses a delay

operator responsive to said input signals to generate a number of delayed signals each corresponding to one of a number of positions relative to said sensors (see col. 3 lines 17-25). Kellermann discloses an area orienting operator responsive to said delayed signals to determine a number of sound source area signals from said delayed signals and a number of coincidence patterns, said patterns each corresponding to one of said positions and relating frequency varying sound source position information caused by ambiguous phase multiples to said one of said positions to improve sound source area optimization (see col. 3 lines 25-61, col. 1 lines 15-37 and col. 4 lines 10-35). Kellermann discloses an output device responsive to said are orienting signals to provide an output corresponding to at least one of said sources (see col. 3 lines 45-67, col. 4 lines 60-67, and col. 5 lines 3-50).

Kellermann disclose area orienting operator responsive to the signals (col. 3 lines 42-44, col. 1 lines 28-33, and col. 3 lines 35-67), said area orienting operator logically being localizing, however, Kellermann does not specifically disclose a localizing operator. Elko teaches a localizing operator (see col. 4 lines 18-41, col. 3 lines 40-65, col. 5 lines 60-67, col. 6 lines 1-7, and col. 5 lines 1-67).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of Kellermann, and have localizing operator, as taught by Elko, thus allowing improved directional sound capability where noise and sources change over relatively short time periods, as discussed by Elko (col. 2 lines 2-10, and col. 1 lines 10-67).

Consider claim 32, Kellermann discloses a system (see col. 1 lines 5-12). Kellermann discloses a pair of spaced apart acoustic sensors each generating a corresponding one of a pair of inputs signals, the signals each being representative of a number of differently located sound

sources (see col. 1 lines 15-36, col. 3 lines 40-45, col. 3 lines 1-25, and col. 5 lines 50-55). Kellermann discloses a signal processor responsive to said sensors (see col. 3 lines 2-5). Kellermann discloses said processor including a means for providing a number of delayed signals from said input signals, the delayed signals each corresponding to one of a number of positions relative to said first and second sensors (see col. 1 lines 29-33, col. 3 lines 40-45, and col. 3 lines 18-25). Kellermann discloses a means for area orienting each of said sound sources to one of said positions as a function of said delayed signals and a corresponding one of a number of patterns of frequency invariant data corresponding to one of said positions and frequency dependent data corresponding to at least two other of said positions (see col. 3 lines 25-67, col. 4 lines 1-67, and col. 5 lines 1-30). Kellermann discloses a means for suppressing a different frequency component of each of a selected number of said sources causing interference and for extracting a desired signal representative of one of said sources (see col. 3 lines 45-67, col. 4 lines 55-67, and col. 5 lines 1-30). Kellermann discloses an output device responsive to said desired signal to provide an output corresponding to said one of said sources (see col. 6 lines 25-65).

Kellermann disclose a means for area orienting as a function of the signals (col. 3 lines 42-44, col. 1 lines 28-33, and col. 3 lines 35-67), said area orienting logically being localizing, however, Kellermann does not specifically disclose a means for localizing. Elko teaches a means for localizing (see col. 4 lines 18-41, col. 3 lines 40-65, col. 5 lines 60-67, col. 6 lines 1-7, and col. 5 lines 1-67).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of Kellermann, and have a means for localizing, as taught by

Elko, thus allowing improved directional sound capability where noise and sources change over relatively short time periods, as discussed by Elko (col. 2 lines 2-10, and col. 1 lines 10-67).

Consider claim 34, Kellermann discloses a signal processing system (see col. 1 lines 5-12).

Kellermann discloses a first sensor at a first location configured to provide a first signal corresponding to an acoustic signal, said acoustic signal including a desired signal emanating from a selected source and noise emanating from a noise source (see col. 5 lines 50-5, col. 3 lines 1-25, col. 3 lines 40-44, and col. 1 lines 15-37). Kellermann discloses a second sensor at a second location configured to provide a second signal corresponding to said acoustic signal (see col. 5 lines 50-5, col. 3 lines 1-25, col. 3 lines 40-44, and col. 1 lines 15-37). Kellermann discloses a signal processor responsive to said first and second signals to generate a discrete first spectral signal corresponding to said first signal and a discrete second spectral signal corresponding to said second signal, said processor being configured to delay said first and second spectral signals by a number of time intervals to generate a number of delayed first signals and a number of delayed second signals and provide a time increment signal, said time increment signal corresponding to area difference of the selected source from the noise source, and said processor being further configured to generate an output signal as a function of said time increment signal (see col. 3 lines 1-67, col. 4 lines 1-67, and col. 5 lines 1-30). Kellermann discloses an output device responsive to said output signal to provide an output representative of said desired signal (see col. 5 lines 50-67, col. 6 lines 1-67, col. 4 lines 65-67, and col. 5 lines 1-10).

Kellermann disclose time increment corresponding to an area difference, (col. 3 lines 42-44, col. 1 lines 28-33, and col. 3 lines 35-67), said area difference logically being separation, however, Kellermann does not specifically disclose time increment corresponding to separation. Elko teaches time increment corresponding to separation (see col. 4 lines 18-41, col. 3 lines 40-65, col. 5 lines 60-67, col. 6 lines 1-7, and col. 5 lines 1-67).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of Kellermann, and have time increment corresponding to separation, as taught by Elko, thus allowing improved directional sound capability where noise and sources change over relatively short time periods, as discussed by Elko (col. 2 lines 2-10, and col. 1 lines 10-67).

Consider claim 41, Kellermann discloses a method of signal processing (see col. 3 lines 1-5). Kellermann discloses positioning a first and second sensor relative to a first signal source, the first and second sensor being spaced apart from each other, and a second signal source being spaced apart from the first signal source (see col. 3 lines 40-45, col. 1 lines 15-37, col. 3 lines 1-25, and col. 5 lines 50-55). Kellermann discloses providing a first signal from the first sensor and a second signal from the second signal, the first and second signals each being representative of a composite acoustic signal including a desired signal from the first signal source and an unwanted signal from the second signal source (see col. 3 lines 18-45, col. 4 lines 60-67, col. 5 lines 1-30, and col. 5 lines 50-67). Kellermann discloses establishing, a number of spectral signals from the first and second signals as a function of a number of frequencies, each of the spectral signals representing a different position relative to the first signal source; determining a member of the spectral signals representative of position of the second signal source; and

generating an output signal from the member, the output signal being representative of spectral content of the first signal (see col. 1 lines 15-40, col. 3 lines 45-67, col. 4 lines 55-67, col. 5 lines 1-30, col. 3 lines 1-67, col. 4 lines 1-67, and col. 5 lines 1-67).

Kellermann discloses determining a member of the spectral signals representing the noise source, (col. 3 lines 42-44, col. 1 lines 28-33, and col. 3 lines 35-67), , however, Kellermann does not specifically disclose determining a spectral member representing position . Elko teaches determining a spectral member representing position (see col. 4 lines 18-41, col. 3 lines 40-65, col. 5 lines 60-67, col. 6 lines 1-7, col. 5 lines 1-67, col. 7 lines 30-65).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of Kellermann, and determining a spectral member representing position, as taught by Elko, thus allowing improved directional sound capability where noise and sources change over relatively short time periods, as discussed by Elko (col. 2 lines 2-10, and col. 1 lines 10-67).

Consider claims 2 and 3, Kellermann discloses suppressing includes extracting, a desired signal representative of the desired source (see col. 2 lines 1-20, col. 3 lines 1-67, and col. 4 lines 1-67).

Consider claim 4, Kellermann discloses area orienting (see col. 3 lines 1-67). Kellermann does not specifically disclose localizing. Elko teaches localizing (see col. 4 lines 18-41, col. 3 lines 40-65, col. 5 lines 60-67, col. 6 lines 1-7, and col. 5 lines 1-67).

It would have been obvious to one of ordinary skill in the art at the time the

invention was made to modify the invention of Kellermann, and localize, as taught by Elko, thus allowing improved directional sound capability where noise and sources change over relatively short time periods, as discussed by Elko (col. 2 lines 2-10, and col. 1 lines 10-67).

Consider claims 5-8, Kellermann discloses using different lines and using transforms wherein the transforms are area oriented (see col. 4 lines 55-67 and col. 5 lines 1-50). Kellermann does not specifically disclose using different lines such localization corresponds to the transform. Elko teaches localizing (see col. 4 lines 18-41, col. 3 lines 40-65, col. 5 lines 60-67, col. 6 lines 1-7, and col. 5 lines 1-67).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of Kellermann, and localize, as taught by Elko, thus allowing improved directional sound capability where noise and sources change over relatively short time periods, as discussed by Elko (col. 2 lines 2-10, and col. 1 lines 10-67).

Consider claim 10, Kellermann discloses area orienting with regard to patterns to determine transform components regarding noise, however does not specifically disclose localizing using the patterns. Elko teaches localizing the patterns (see col. 4 lines 18-41, col. 3 lines 40-65, col. 5 lines 60-67, col. 6 lines 1-7, and col. 5 lines 1-67).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of Kellermann, and localize using the patterns, as taught by Elko, thus allowing improved directional sound capability where noise and sources change over relatively short time periods, as discussed by Elko (col. 2 lines 2-10, and col. 1 lines 10-67).

Consider claims 11 27, 28, and 31, the combination above discloses an analog-to-digital converter responsive to said input signals to convert each of said input signals from an analog

form to a digital form; a first transformation stage responsive to said digital form of said input signals to transform said input signals from a time domain form to a frequency domain form in terms of a plurality of discrete frequencies, said delay operator including a dual delay line for each of the frequencies; a second transformation stage responsive to said desired signal to transform said desired signal from a digital frequency domain form to a digital time domain form; and a digital-to-analog converter responsive to said digital time domain form to convert said desired signal to an analog output form said output device.

Consider claims 13 and 14, Kellermann discloses choosing said desired signals as a function of said interfering signals (see col. 3 lines 1-67 and col. 4 lines 1-67).

Consider claims 15 and 16, Kellermann discloses a ratio of signals and propagation to select output signals (see col. 3 lines 1-67, and col. 5 lines 2-25). Kellermann does not specifically disclose a ratio of the difference in propagation measurements. Elko teaches a ratio of the difference in propagation measurements (see col. 4 lines 18-41, col. 3 lines 40-65, col. 5 lines 60-67, col. 6 lines 1-7, and col. 5 lines 1-67).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of Kellermann, and have a ratio of the difference in propagation measurements, as taught by Elko, thus allowing improved directional sound capability where noise and sources change over relatively short time periods, as discussed by Elko (col. 2 lines 2-10, and col. 1 lines 10-67).

Consider claim 33, Kellermann does not specifically disclose the processor includes a means for adjusting said delayed signals with a head-related transfer-function. Elko teaches the processor includes a means for adjusting said delayed signals with a head-related transfer-

function (see col. 3 lines 40-65). It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of Kellermann, and have the processor includes a means for adjusting said delayed signals with a head-related transfer-function, as taught by Elko, thus allowing improved directional sound capability where noise and sources change over relatively short time periods, as discussed by Elko (col. 2 lines 2-10, and col. 1 lines 10-67).

3. Claims 12, 18-24, 30, and 35-40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kellermann in view of Elko as applied to claims 1, 9, 17, 26, 32, 34, and 41, above, and further in view of Knead et al. (4,536,887).

Consider claims 12 and 30, Kellermann and Elko do not specifically discloses said delay operator, said localization operator, and said extraction operator are provided by a solid state signal processing device. Official notice is taken that both the concept and advantage of using solid-state circuits for the different operators in a circuit are well known and expected in the art for integrating discrete components and alleviating the need for moving parts. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of Kellermann and Elko, and have said delay operator, said localization operator, and said extraction operator are provided by a solid state signal processing device, thus allowing integration of the circuits into a compact package.

Consider claims 18-20, Kellermann and Elko disclose using reference signals applied for suggesting the signals (see Kellermann col. 6 lines 1-30 and Elko col. 4 lines 17-41). Kellermann and Elko do not specifically disclose a fictitious signal. Kaneda teaches using fictitious signals (see abstract lines 1-10, col. 1 lines 37-67, col. 3 lines 25-65, col. 4 lines 65-67,

and col. 5 lines 1-67). It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of Kellermann and Elko, and use a fictitious signal, as taught by Kaneda , thus allowing adaptive selection of the desired signals, as discussed by Kaneda (col. 1 lines 5-35).

Consider claims 21-24, and 36-40, Kellermann and Elko disclose using reference signals applied for suggesting the signals to determine patterns via transforms and isolating or elimination noise to reduce the noise in particular area by localization to reduce noise (see Kellermann col. 6 lines 1-30 and Elko col. 4 lines 17-41). Kellermann and Elko do not specifically disclose using a fictitious signal for localizing in a particular area to reduce noise. Kaneda teaches using fictions signals (see abstract lines 1-10, col. 1 lines 37-67, col. 3 lines 25-65, col. 4 lines 65-67, and col. 5 lines 1-67). It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of Kellermann and Elko, and use a fictitious signal for localizing in a particular area to reduce noise, as taught by Kaneda , thus allowing adaptive selection of the desired signals, as discussed by Kaneda (col. 1 lines 5-35).

4. Claims 25, 29, and 42, 44, and 45, are rejected under 35 U.S.C. 103(a) as being unpatentable over Kellermann in vie of Elko as applied to claim 17 above, and further in view of Ross et al. (5,712,830).

Consider claims 25, 29, and 42, 44, and 45, Kellermann, discloses the method and system where signals are received and delayed by directional microphone system. Kellermann and Elko do not show azimuth. Ross teaches azimuth (see col. 4 lines 9-26). It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of

Kellermann and Elko, and have azimuth, as taught by Ross, thus more accurate position of sound, as discussed by Ross (col. 1 lines 50-53).

5. Claims 35 and 42 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kellermann in view of Elko as applied to claim 41 above, and further in view of Kryter et al. (3,894,195).

Consider claims 35 and 42, Kellermann and Elko do not specifically disclose a hearing aid with speaker. Kryter teaches a hearing aid (see col. 1 lines 3-6, and col. 4 lines 45-5). It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of Kellermann and Elko , and have a hearing aid, as taught by Kryter, thus allowing improvement of noise immunity, as discussed by Kryter (col. 3 lines 55-67) .

Conclusion

6. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nick Corsaro whose telephone number is 703-306-5616. The examiner can normally be reached on 7:00-3:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nay A Maung can be reached on 703-308-7745. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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